

Operáció rendszerek Bsc

4. Gyakorlat

2022.03.01

készítette:

Czikó Tivadar

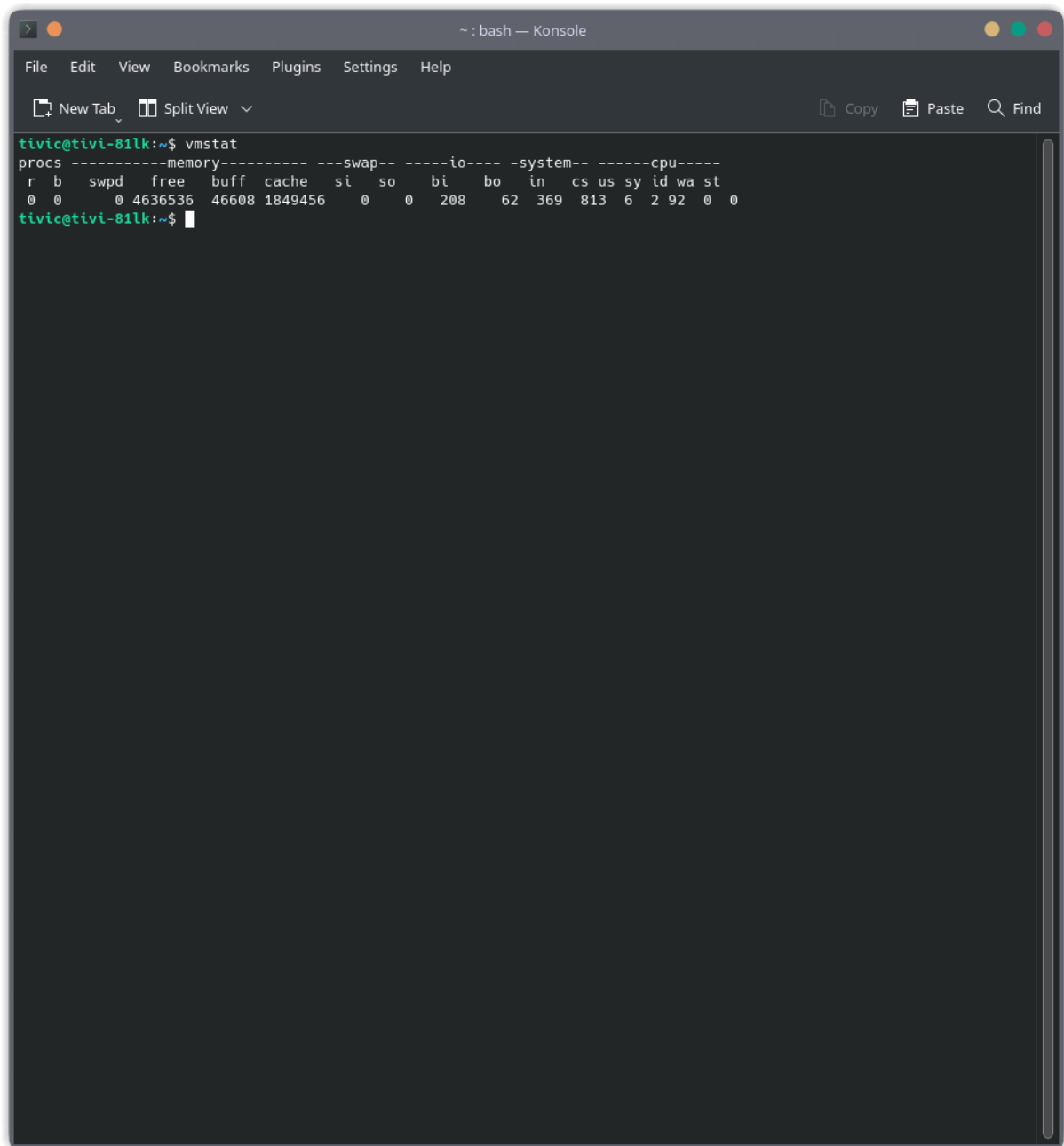
Programtervező Informatikus

O2IXLB

Miskolc, 2022

1.Feladata.

a) Kérdezze le a futó processzek listáját terhelés szerint! Monitorozza a terhelést folyamatosan!



```
tivic@tivi-81lk:~$ vmstat
procs -----memory----- ---swap-- ----io---- -system-- -----cpu-----
r  b  swpd  free  buff  cache   si   so    bi   bo    in  cs us sy id wa st
0  0      0 4636536 46608 1849456    0    0   208   62   369  813  6  2 92  0  0
tivic@tivi-81lk:~$
```

b.) Kérdezze le a rendszer aktivitásról és a hardverről az információkat (a jelentések a folyamatokra, memóriára, blokk input/outputra, CPU tevékenységre és trap-re vonatkoznak.)

- használjon a parancshoz kapcsolót, amely memória kihasználtságot és a lemez információkat mutatja.
- használjon a parancshoz kapcsolót, amely aktív és inaktív memória lapokat mutatja!

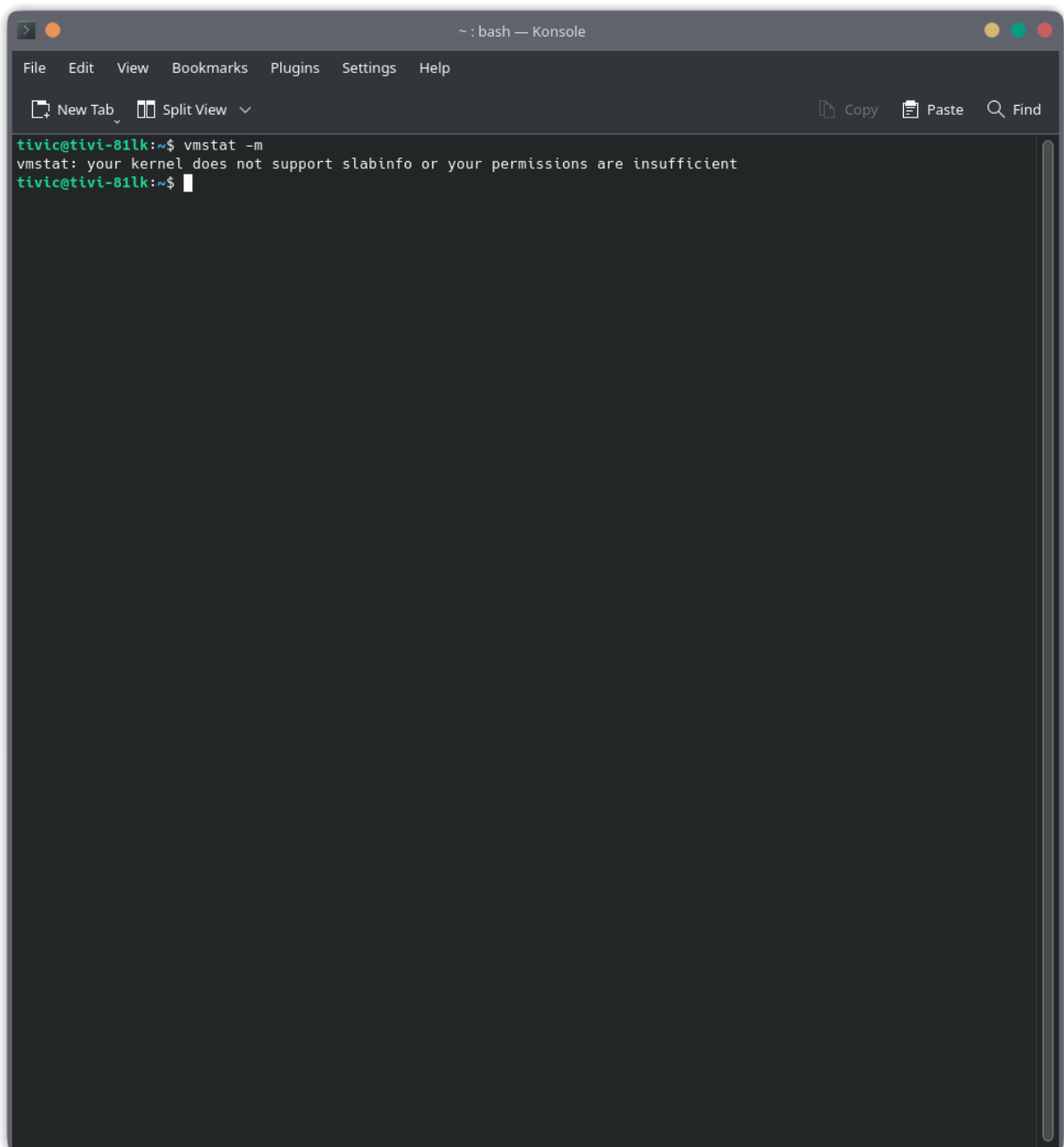
~ : vmstat — Konsole

File Edit View Bookmarks Plugins Settings Help

New Tab Split View

Copy Paste Find

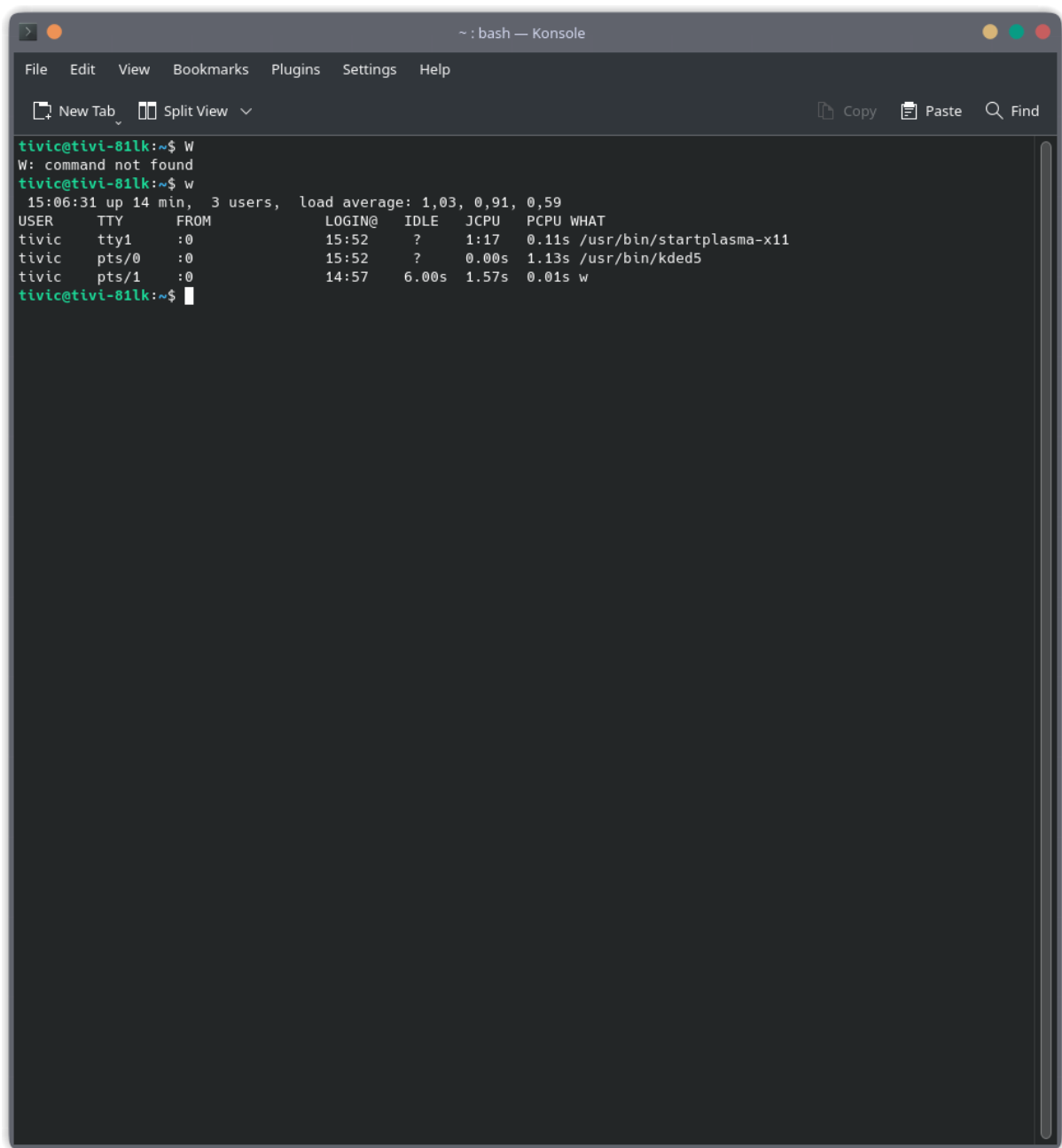
```
tivic@tivi-81lk:~$ vmstat
procs -----memory----- --swap-- ----io---- -system-- -----cpu-----
r b  swpd  free  buff  cache  si  so    bi   bo    in  cs us sy id wa st
0 0      0 4636536 46608 1849456  0  0    208   62  369  813  6  2 92  0  0
tivic@tivi-81lk:~$ vmstat 3
procs -----memory----- --swap-- ----io---- -system-- -----cpu-----
r b  swpd  free  buff  cache  si  so    bi   bo    in  cs us sy id wa st
0 0      0 4605052 46792 1866200  0  0    185   56  357  782  6  2 92  0  0
0 0      0 4608400 46792 1862696  0  0      0   0 1052 2676  3  1 96  0  0
1 0      0 4588132 46800 1884576  0  0      0   9 3043 6501  5  2 93  0  0
0 0      0 4604080 46800 1868404  0  0      0   0 4262 5640  4  1 94  0  0
0 0      0 4603696 46800 1868464  0  0      0  19 3553 4834  3  1 95  0  0
```



A terminal window titled "~ : bash — Konsole" with a menu bar (File, Edit, View, Bookmarks, Plugins, Settings, Help) and a toolbar (New Tab, Split View, Copy, Paste, Find). The terminal shows the command `vmstat -m` being executed, which results in the error message: `vmstat: your kernel does not support slabinfo or your permissions are insufficient`. The prompt `tivic@tivi-81lk:~$` is shown twice, once before and once after the error message.

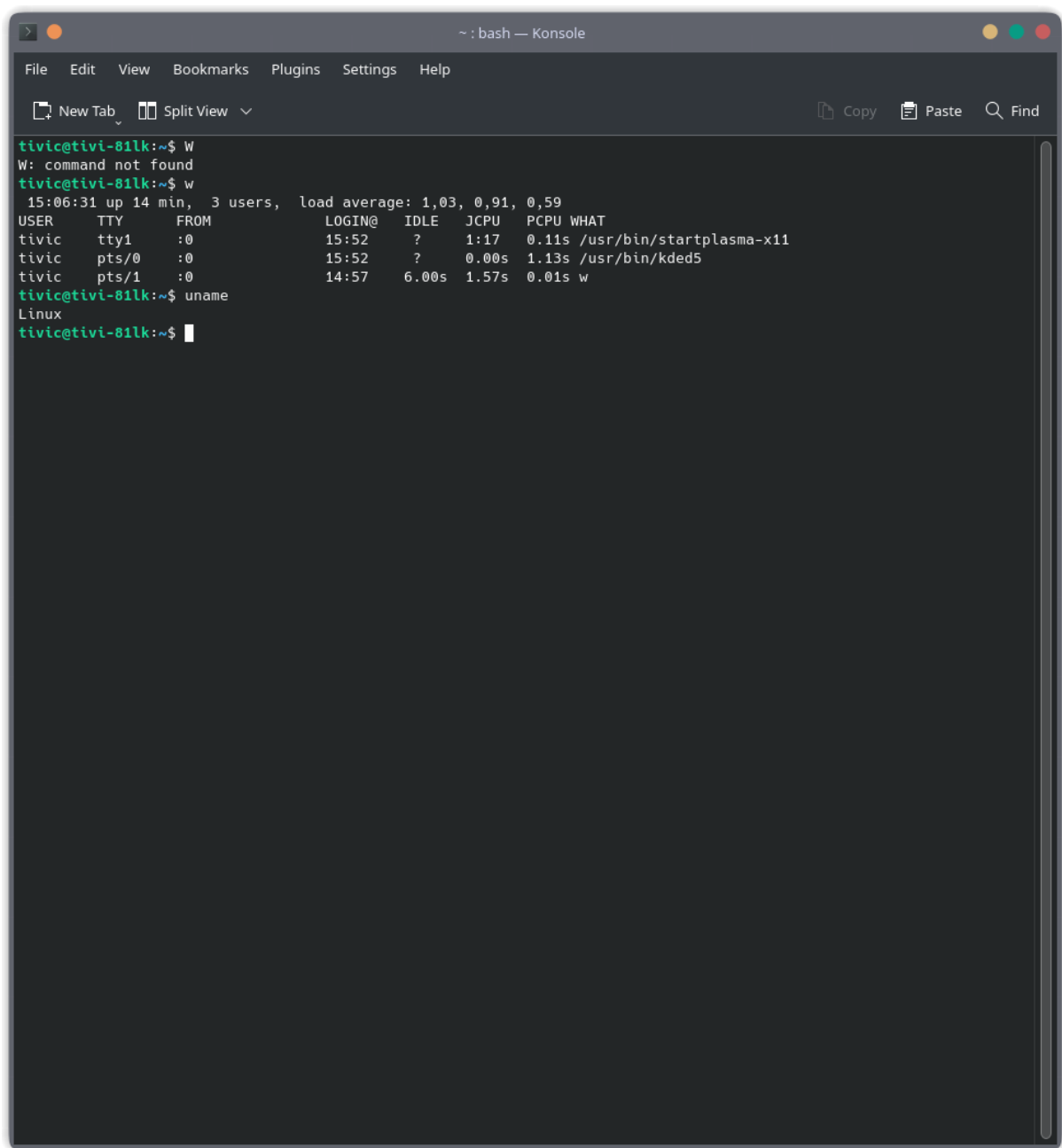
```
tivic@tivi-81lk:~$ vmstat -m
vmstat: your kernel does not support slabinfo or your permissions are insufficient
tivic@tivi-81lk:~$
```

c.) Kérdezze le ki van bejelentkezve a rendszerbe, és éppen mit csinál.



```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View
tivik@tivi-8ilk:~$ W
W: command not found
tivik@tivi-8ilk:~$ w
 15:06:31 up 14 min,  3 users,  load average: 1,03, 0,91, 0,59
USER      TTY      FROM              LOGIN@   IDLE   JCPU   PCPU   WHAT
tivik     tty1     :0                15:52    ?      1:17   0.11s  /usr/bin/startplasma-x11
tivik     pts/0    :0                15:52    ?      0.00s  1.13s  /usr/bin/kded5
tivik     pts/1    :0                14:57    6.00s  1.57s  0.01s  w
tivik@tivi-8ilk:~$
```

d.) Kérdezze le a szerver futásának kezdő idejét.



```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View
Copy Paste Find

tivic@tivi-81lk:~$ W
W: command not found
tivic@tivi-81lk:~$ w
 15:06:31 up 14 min,  3 users,  load average: 1,03, 0,91, 0,59
USER      TTY      FROM             LOGIN@   IDLE   JCPU   PCPU   WHAT
tivic     tty1     :0                15:52    ?      1:17   0.11s  /usr/bin/startplasma-x11
tivic     pts/0    :0                15:52    ?      0.00s  1.13s  /usr/bin/kded5
tivic     pts/1    :0                14:57    6.00s  1.57s  0.01s  w
tivic@tivi-81lk:~$ uname
Linux
tivic@tivi-81lk:~$
```

e.) ps - aktuális processzekről készít jelentést. Opciói:

- Kérdezze le az összes processz kiválasztását!

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find
1296 ?      00:00:00 kioslave5
1298 ?      00:00:00 kioslave5
1680 ?      00:00:35 GeckoMain
1749 ?      00:00:00 Socket Process
1792 ?      00:00:00 Privileged Cont
1842 ?      00:00:04 WebExtensions
2029 ?      00:00:01 Isolated Web Co
2078 ?      00:00:00 Isolated Web Co
2104 ?      00:00:01 Isolated Web Co
2127 ?      00:00:00 kioslave5
2176 ?      00:00:01 fwupd
2318 ?      00:00:00 kio_http_cache_
2321 ?      00:00:01 flatpak-system-
2322 ?      00:00:03 okular
2400 ?      00:00:00 Web Content
2448 ?      00:00:00 Web Content
2452 ?      00:00:00 Web Content
2521 ?      00:00:01 konsole
2531 pts/1    00:00:00 bash
2543 ?      00:00:00 spectacle
2568 pts/1    00:00:00 ps
tivictivi-81lk:~$
```

- Kérdezze le az egyes processzek paramétereit!

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find
4 S 1000 1749 1680 0 80 0 - 47853 poll_s ? 00:00:00 Socket Process
4 S 1000 1792 1680 0 80 0 - 609721 poll_s ? 00:00:00 Privileged Cont
4 S 1000 1842 1680 2 80 0 - 646900 poll_s ? 00:00:04 WebExtensions
4 S 1000 2029 1680 1 80 0 - 611885 poll_s ? 00:00:02 Isolated Web Co
4 S 1000 2078 1680 0 80 0 - 607664 poll_s ? 00:00:00 Isolated Web Co
4 S 1000 2104 1680 0 80 0 - 612767 poll_s ? 00:00:01 Isolated Web Co
0 S 1000 2127 1 0 80 0 - 21493 poll_s ? 00:00:00 kioslave5
4 S 0 2176 1 0 80 0 - 109855 - ? 00:00:01 fwupd
0 S 1000 2318 1 0 80 0 - 39904 poll_s ? 00:00:00 kio_http_cache_
4 S 0 2321 1 0 80 0 - 143537 - ? 00:00:01 flatpak-system-
0 S 1000 2322 1 2 80 0 - 238912 poll_s ? 00:00:03 okular
4 S 1000 2400 1680 0 80 0 - 597743 poll_s ? 00:00:00 Web Content
4 S 1000 2448 1680 0 80 0 - 597743 poll_s ? 00:00:00 Web Content
4 S 1000 2452 1680 0 80 0 - 597743 poll_s ? 00:00:00 Web Content
0 R 1000 2521 1063 1 80 0 - 201876 - ? 00:00:01 konsole
0 S 1000 2531 2521 0 80 0 - 2759 do_wai pts/1 00:00:00 bash
0 S 1000 2543 878 1 80 0 - 269164 poll_s ? 00:00:02 spectacle
0 S 1000 2579 878 0 80 0 - 67130903 poll_s ? 00:00:00 kioslave5
0 S 1000 2581 878 0 80 0 - 21513 poll_s ? 00:00:00 kioslave5
0 S 1000 2583 878 0 80 0 - 21513 poll_s ? 00:00:00 kioslave5
4 R 1000 2591 2531 0 80 0 - 2925 - pts/1 00:00:00 ps
tivictivi-81lk:~$
```

- Kérdezze le az egyes processzek szálait is!

```
~ : bash — Konsole

File Edit View Bookmarks Plugins Settings Help

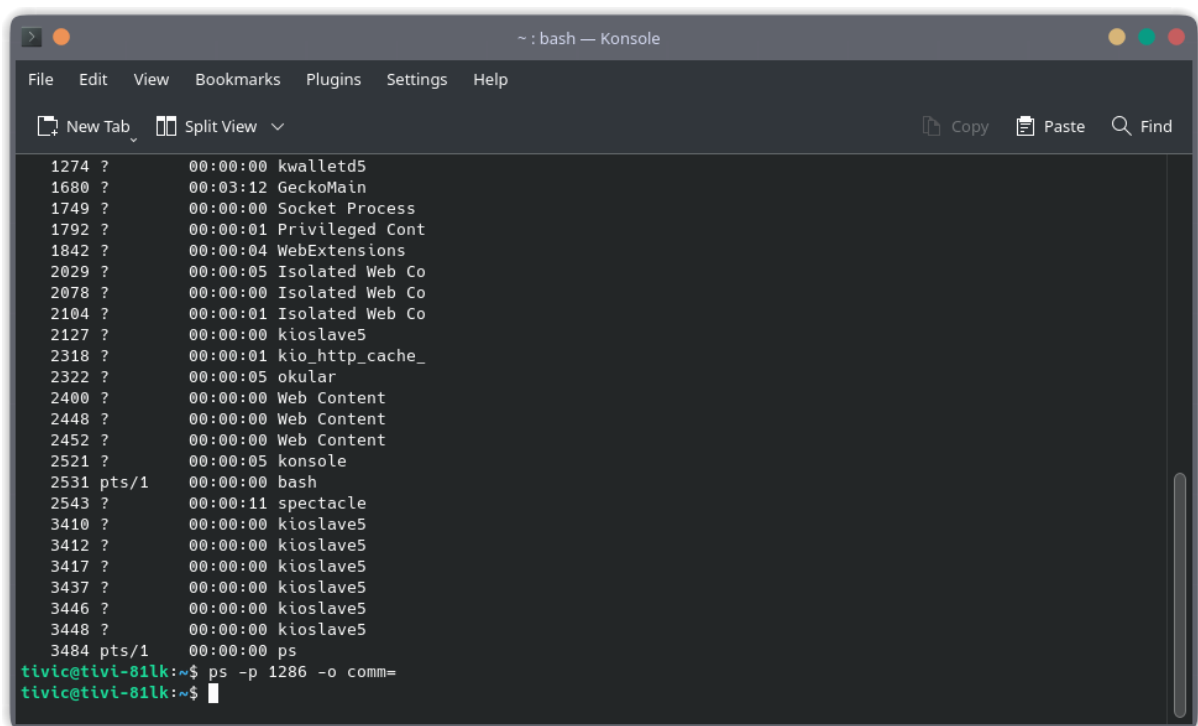
New Tab Split View Copy Paste Find

4 S tivik 1792 1680 0 80 0 - 609721 poll_s 15:12 ? 00:00:00 /usr/lib/firefox/firefox -contentpro
4 S tivik 1842 1680 1 80 0 - 646900 poll_s 15:12 ? 00:00:04 /usr/lib/firefox/firefox -contentpro
4 S tivik 2029 1680 1 80 0 - 611885 poll_s 15:12 ? 00:00:03 /usr/lib/firefox/firefox -contentpro
4 S tivik 2078 1680 0 80 0 - 607664 poll_s 15:12 ? 00:00:00 /usr/lib/firefox/firefox -contentpro
4 S tivik 2104 1680 0 80 0 - 612759 poll_s 15:12 ? 00:00:01 /usr/lib/firefox/firefox -contentpro
0 S tivik 2127 1 0 80 0 - 21493 poll_s 15:12 ? 00:00:00 /usr/lib/x86_64-linux-gnu/libexec/kf
4 S root 2176 1 0 80 0 - 109855 - 15:12 ? 00:00:01 /usr/libexec/fwupd/fwupd
0 S tivik 2318 1 0 80 0 - 39904 poll_s 15:12 ? 00:00:00 /usr/lib/x86_64-linux-gnu/libexec/kf
4 S root 2321 1 0 80 0 - 143537 - 15:13 ? 00:00:01 /usr/libexec/flatpak-system-helper
0 S tivik 2322 1 1 80 0 - 238912 poll_s 15:13 ? 00:00:03 /usr/bin/okular /home/tivik/Download
4 S tivik 2400 1680 0 80 0 - 597743 poll_s 15:13 ? 00:00:00 /usr/lib/firefox/firefox -contentpro
4 S tivik 2448 1680 0 80 0 - 597743 poll_s 15:13 ? 00:00:00 /usr/lib/firefox/firefox -contentpro
4 S tivik 2452 1680 0 80 0 - 597743 poll_s 15:13 ? 00:00:00 /usr/lib/firefox/firefox -contentpro
0 R tivik 2521 1063 1 80 0 - 202074 poll_s 15:13 ? 00:00:01 /usr/bin/konsole
0 S tivik 2531 2521 0 80 0 - 2759 do_wai 15:13 pts/1 00:00:00 /bin/bash
0 S tivik 2543 878 2 80 0 - 285591 poll_s 15:13 ? 00:00:04 /usr/bin/spectacle
0 S tivik 2579 878 0 80 0 - 67130903 poll_s 15:14 ? 00:00:00 /usr/lib/x86_64-linux-gnu/libexec/kf
0 S tivik 2581 878 0 80 0 - 21513 poll_s 15:14 ? 00:00:00 /usr/lib/x86_64-linux-gnu/libexec/kf
0 S tivik 2583 878 0 80 0 - 21541 poll_s 15:14 ? 00:00:00 /usr/lib/x86_64-linux-gnu/libexec/kf
0 S tivik 2598 878 0 80 0 - 278627 poll_s 15:15 ? 00:00:00 /usr/lib/x86_64-linux-gnu/libexec/kf
4 R tivik 2624 2531 0 80 0 - 2945 - 15:16 pts/1 00:00:00 ps -Alf
tivik@tivi-81lk:~$
```


- Kérdezze le a szerver összes processzeit!

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find
982 ? S 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/start_kdeinit
983 ? Ss 0:00 kdeinit5: Running...
984 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/klauncher --fd=9
1000 ? Sl 0:01 /usr/bin/kded5
1006 ? Sl 1:24 /usr/bin/kwin_x11
1021 ? Ssl 0:00 /usr/bin/kglobalaccel5
1029 ? Sl 0:00 /usr/bin/ksmserver
1030 ? Ssl 0:00 /usr/lib/x86_64-linux-gnu/libexec/kactivitymanagerd
1035 ? Sl 0:00 /usr/libexec/dconf-service
1042 ? S 0:00 /usr/bin/xsettingsd
1055 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/polkit-kde-authentication-agent-1
1057 ? Sml 0:00 /usr/lib/x86_64-linux-gnu/libexec/baloo_file
1060 ? Sl 0:00 /usr/bin/kaccess
1063 ? Sl 0:10 /usr/bin/plasmashell
1071 ? Sl 0:00 /usr/bin/xembedsniproxy
1074 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/org_kde_powerdevil
1083 ? Sl 0:00 /usr/bin/gmenudbusmenuproxy
1092 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/kdeconnectd
1098 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/DiscoverNotifier
1157 ? Sl 0:00 /usr/libexec/geoclue-2.0/demos/agent
1160 ? Sl 0:00 /usr/libexec/at-spi-bus-launcher --launch-immediately
1177 ? S 0:00 /usr/share/defaults/at-spi2/accessibility.conf --no
1196 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kscreen_backend_launcher
1207 ? Ss 0:00 /usr/lib/bluetooth/obexd
1235 ? S 0:00 bpfILTER_umh
1274 ? Sll 0:00 /usr/bin/kwalletd5
1680 ? Sl 2:59 /usr/lib/firefox/firefox
1749 ? Sl 0:00 /usr/lib/firefox/firefox -contentproc -parentBuildID 20211215221728 -prefsLen 1 -prefM
1792 ? Sl 0:01 /usr/lib/firefox/firefox -contentproc -childID 1 -isForBrowser -prefsLen 127 -prefMapS
1842 ? Sl 0:04 /usr/lib/firefox/firefox -contentproc -childID 2 -isForBrowser -prefsLen 4843 -prefMap
2029 ? Sl 0:04 /usr/lib/firefox/firefox -contentproc -childID 7 -isForBrowser -prefsLen 5478 -prefMap
2078 ? Sl 0:00 /usr/lib/firefox/firefox -contentproc -childID 8 -isForBrowser -prefsLen 5698 -prefMap
2104 ? Sl 0:01 /usr/lib/firefox/firefox -contentproc -childID 9 -isForBrowser -prefsLen 5698 -prefMap
2127 ? S 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kioslave5 /usr/lib/x86_64-linux-gnu/qt5/plugins/
2176 ? Ssl 0:01 /usr/libexec/fwupd/fwupd
2318 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kio_http_cache_cleaner
2322 ? Sl 0:05 /usr/bin/okular /home/tivic/Downloads/4. Gyak_K04_2022 tavasz.pdf
2400 ? Sl 0:00 /usr/lib/firefox/firefox -contentproc -childID 10 -isForBrowser -prefsLen 5745 -prefMa
2448 ? Sl 0:00 /usr/lib/firefox/firefox -contentproc -childID 11 -isForBrowser -prefsLen 5745 -prefMa
2452 ? Sl 0:00 /usr/lib/firefox/firefox -contentproc -childID 12 -isForBrowser -prefsLen 5745 -prefMa
2521 ? Rl 0:04 /usr/bin/konsole
2531 pts/1 Ss 0:00 /bin/bash
2543 ? Sl 0:09 /usr/bin/spectacle
3270 ? I 0:00 [kworker/u16:0-events_unbound]
3330 ? I 0:00 [kworker/u16:2-events_unbound]
3335 ? I 0:00 [kworker/3:1-events]
3410 ? S 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kioslave5 /usr/lib/x86_64-linux-gnu/qt5/plugins/
3412 ? S 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kioslave5 /usr/lib/x86_64-linux-gnu/qt5/plugins/
3417 ? Sl 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kioslave5 /usr/lib/x86_64-linux-gnu/qt5/plugins/
3437 ? S 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kioslave5 /usr/lib/x86_64-linux-gnu/qt5/plugins/
3446 ? S 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kioslave5 /usr/lib/x86_64-linux-gnu/qt5/plugins/
3448 ? S 0:00 /usr/lib/x86_64-linux-gnu/libexec/kf5/kioslave5 /usr/lib/x86_64-linux-gnu/qt5/plugins/
3454 pts/1 R+ 0:00 ps ax
tivic@tivi-81lk:~$
```

- Kérdezze le milyen processzek futnak a rendszerben

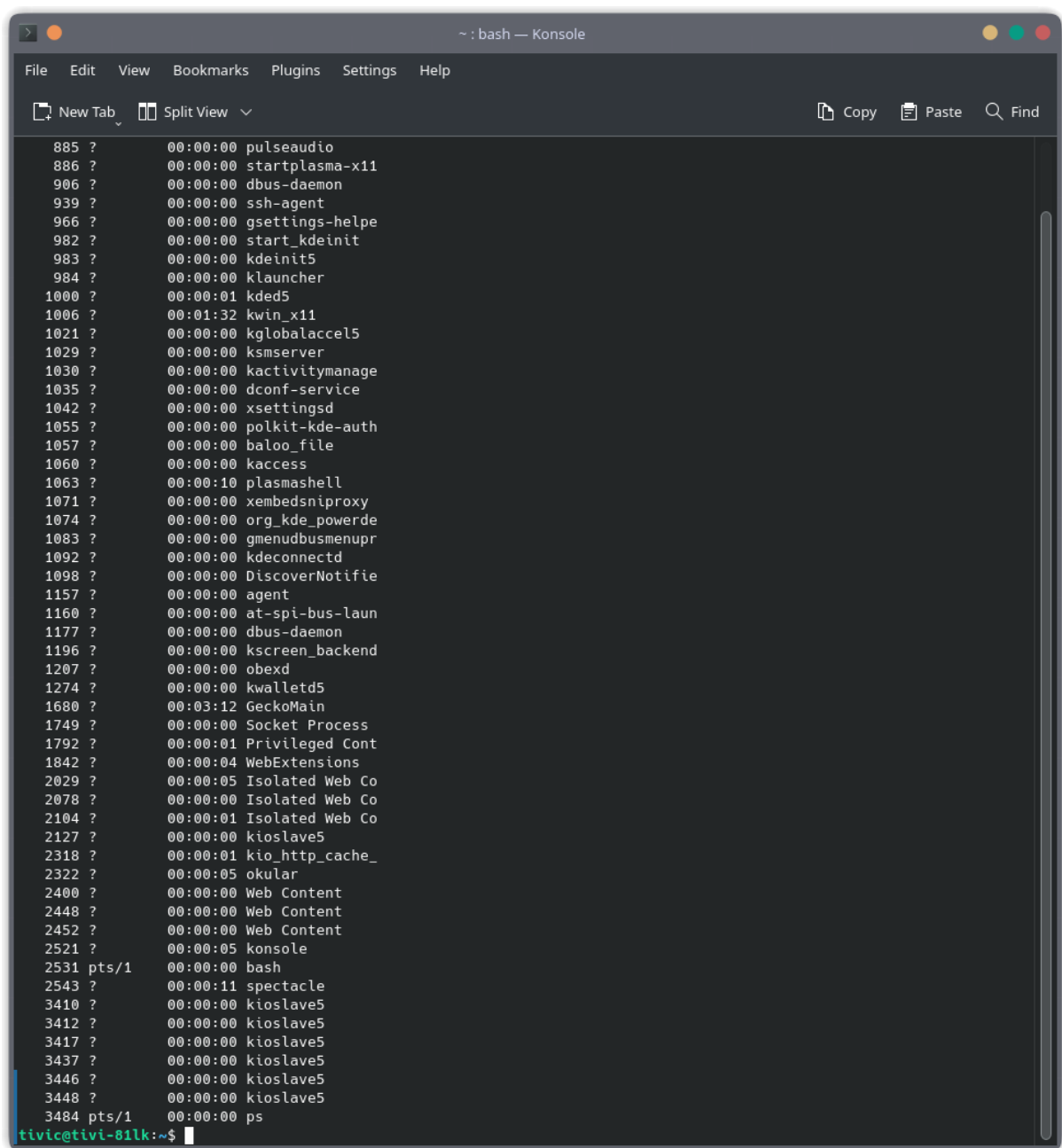


The screenshot shows a terminal window titled '~ : bash — Konsole'. The window has a menu bar with 'File', 'Edit', 'View', 'Bookmarks', 'Plugins', 'Settings', and 'Help'. Below the menu bar, there are buttons for 'New Tab', 'Split View', 'Copy', 'Paste', and 'Find'. The terminal output displays a list of running processes with their PID, PPID, and command name. The processes listed are:

PID	PPID	Command
1274	?	kwalletd5
1680	?	GeckoMain
1749	?	Socket Process
1792	?	Privileged Cont
1842	?	WebExtensions
2029	?	Isolated Web Co
2078	?	Isolated Web Co
2104	?	Isolated Web Co
2127	?	kioslave5
2318	?	kio_http_cache_
2322	?	okular
2400	?	Web Content
2448	?	Web Content
2452	?	Web Content
2521	?	konsole
2531	pts/1	bash
2543	?	spectacle
3410	?	kioslave5
3412	?	kioslave5
3417	?	kioslave5
3437	?	kioslave5
3446	?	kioslave5
3448	?	kioslave5
3484	pts/1	ps

The user has entered the command `ps -p 1286 -o comm=` and the terminal is waiting for input.

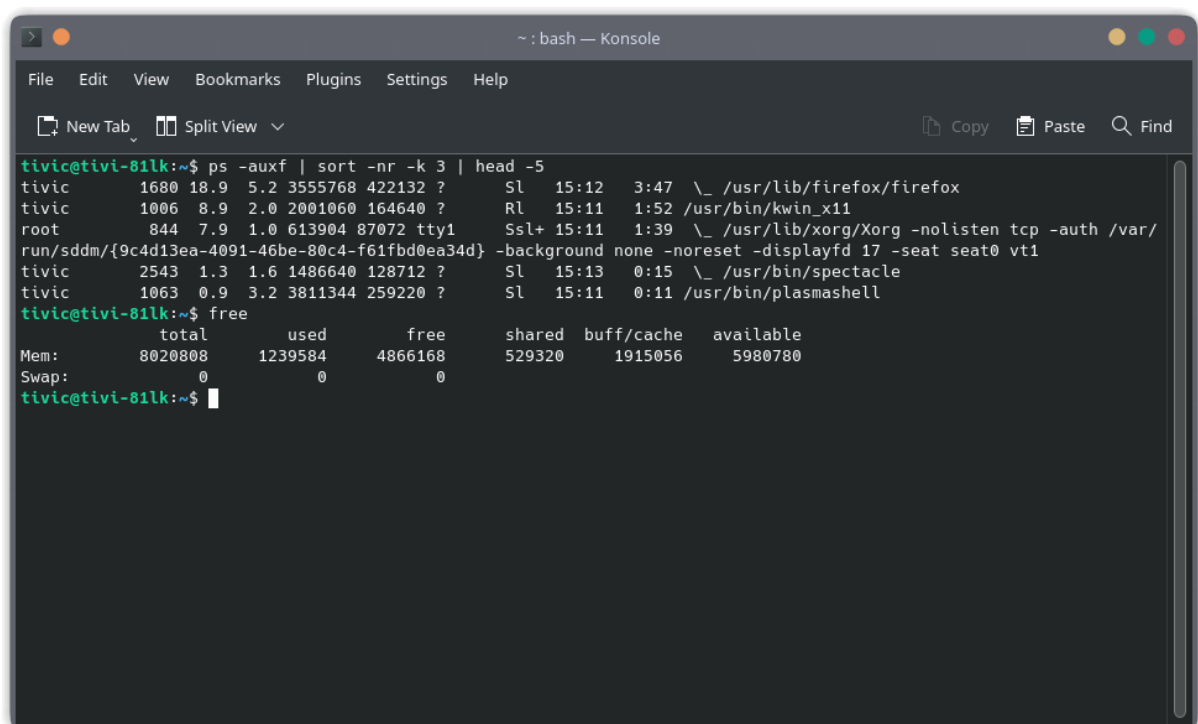
- Kérdezze le a futó processzek listáját fa elrendezésben



The screenshot shows a terminal window titled '~ : bash — Konsole'. The terminal displays the output of the 'ps' command in a tree view, showing the hierarchy of running processes. The processes are listed with their PID, PPID, and command name. The output is as follows:

```
885 ?      00:00:00 pulseaudio
886 ?      00:00:00 startplasma-x11
906 ?      00:00:00 dbus-daemon
939 ?      00:00:00 ssh-agent
966 ?      00:00:00 gsettings-helpe
982 ?      00:00:00 start_kdeinit
983 ?      00:00:00 kdeinit5
984 ?      00:00:00 klauncher
1000 ?     00:00:01 kded5
1006 ?     00:01:32 kwin_x11
1021 ?     00:00:00 kglobalaccel5
1029 ?     00:00:00 ksmserver
1030 ?     00:00:00 kactivitymanage
1035 ?     00:00:00 dconf-service
1042 ?     00:00:00 xsettingsd
1055 ?     00:00:00 polkit-kde-auth
1057 ?     00:00:00 baloo_file
1060 ?     00:00:00 kaccess
1063 ?     00:00:10 plasmashell
1071 ?     00:00:00 xembedsniproxy
1074 ?     00:00:00 org_kde_powerde
1083 ?     00:00:00 gmenudbusmenupr
1092 ?     00:00:00 kdeconnectd
1098 ?     00:00:00 DiscoverNotifie
1157 ?     00:00:00 agent
1160 ?     00:00:00 at-spi-bus-laun
1177 ?     00:00:00 dbus-daemon
1196 ?     00:00:00 kscreen_backend
1207 ?     00:00:00 obexd
1274 ?     00:00:00 kwalletd5
1680 ?     00:03:12 GeckoMain
1749 ?     00:00:00 Socket Process
1792 ?     00:00:01 Privileged Cont
1842 ?     00:00:04 WebExtensions
2029 ?     00:00:05 Isolated Web Co
2078 ?     00:00:00 Isolated Web Co
2104 ?     00:00:01 Isolated Web Co
2127 ?     00:00:00 kioslave5
2318 ?     00:00:01 kio_http_cache_
2322 ?     00:00:05 okular
2400 ?     00:00:00 Web Content
2448 ?     00:00:00 Web Content
2452 ?     00:00:00 Web Content
2521 ?     00:00:05 konsole
2531 pts/1  00:00:00 bash
2543 ?     00:00:11 spectacle
3410 ?     00:00:00 kioslave5
3412 ?     00:00:00 kioslave5
3417 ?     00:00:00 kioslave5
3437 ?     00:00:00 kioslave5
3446 ?     00:00:00 kioslave5
3448 ?     00:00:00 kioslave5
3484 pts/1  00:00:00 ps
tiviv@tivi-8ilk:~$
```

- Kérdezze le egy adott PID nevét: `ps -p 1286 -o comm=`



```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find
tivic@tivi-81lk:~$ ps -auxf | sort -nr -k 3 | head -5
tivic      1680  18.9   5.2 3555768 422132 ?        Ssl  15:12   3:47 \_ /usr/lib/firefox/firefox
tivic      1006   8.9   2.0 2001060 164640 ?        Rl   15:11   1:52 /usr/bin/kwin_x11
root        844    7.9   1.0 613904 87072 tty1    Ssl+ 15:11   1:39 \_ /usr/lib/xorg/Xorg -nolisten tcp -auth /var/
run/sddm/{9c4d13ea-4091-46be-80c4-f61fbd0ea34d} -background none -noreset -displayfd 17 -seat seat0 vt1
tivic      2543   1.3   1.6 1486640 128712 ?        Ssl  15:13   0:15 \_ /usr/bin/spectacle
tivic      1063   0.9   3.2 3811344 259220 ?        Ssl  15:11   0:11 /usr/bin/plasmashell
tivic@tivi-81lk:~$ free
              total        used        free      shared  buff/cache   available
Mem:           8020808      1239584      4866168        529320       1915056       5980780
Swap:              0              0              0
tivic@tivi-81lk:~$
```

- Kérdezze le az 5 legtöbb CPU memóriát fogyasztó PID. `ps -auxf | sort -nr -k 3 | head -5` – A `ps` nagyon sok opcióval, paraméterrel rendelkezik. Lásd: URL: <http://pclos.janu.hu/?p=878>

f.) Kérdezze le a fizikai memória és a swap által használt és szabad terület, ezek összegét, pufferek, szabad pufferek száma!

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find

tivic@tivi-81lk:~$ free -b
              total        used        free      shared  buff/cache   available
Mem:      8213307392    1270456320    4978610176    544870400    1964240896    6120341504
Swap:              0              0              0

tivic@tivi-81lk:~$ free -k
              total        used        free      shared  buff/cache   available
Mem:         8020808      1240640      4862868      531188      1917300      5977848
Swap:              0              0              0

tivic@tivi-81lk:~$ free -m
              total        used        free      shared  buff/cache   available
Mem:          7832         1212         4748          518          1872          5837
Swap:              0              0              0

tivic@tivi-81lk:~$ free -g
              total        used        free      shared  buff/cache   available
Mem:              7           1           4           0           1           5
Swap:              0           0           0

tivic@tivi-81lk:~$ free -t
              total        used        free      shared  buff/cache   available
Mem:         8020808      1240380      4862168      532148      1918260      5977148
Swap:              0              0              0
Total:         8020808      1240380      4862168

tivic@tivi-81lk:~$ free -o
free: invalid option -- 'o'

Usage:
free [options]

Options:
-b, --bytes          show output in bytes
--kilo              show output in kilobytes
--mega              show output in megabytes
--giga              show output in gigabytes
--tera              show output in terabytes
--peta              show output in petabytes
-k, --kibi           show output in kibibytes
-m, --mebi           show output in mebibytes
-g, --gibi           show output in gibibytes
--tebi              show output in tebibytes
--pebi              show output in pebibytes
-h, --human          show human-readable output
--si                use powers of 1000 not 1024
-l, --lohi           show detailed low and high memory statistics
-t, --total          show total for RAM + swap
-s N, --seconds N    repeat printing every N seconds
-c N, --count N      repeat printing N times, then exit
-w, --wide           wide output

--help              display this help and exit
-V, --version        output version information and exit

For more details see free(1).
tivic@tivi-81lk:~$ free -s
free: option requires an argument -- 's'

Usage:
free [options]
```

- \$ free Használja a következő opciókat külön-külön [- b, - k, - m, - g, - t, - o, - s, - v] – mit kérdezt le!

```
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tivice@tivi-81lk:~$ free -b
      total        used        free      shared  buff/cache   available
Mem:    8213307392    1270456320    4978610176    544870400    1964240896    6120341504
Swap:          0              0              0

tivice@tivi-81lk:~$ free -k
      total        used        free      shared  buff/cache   available
Mem:    8020808      1240640     4862868     531188     1917300     5977848
Swap:          0              0              0

tivice@tivi-81lk:~$ free -m
      total        used        free      shared  buff/cache   available
Mem:        7832         1212         4748         518         1872         5837
Swap:          0              0              0

tivice@tivi-81lk:~$ free -g
      total        used        free      shared  buff/cache   available
Mem:          7           1           4           0           1           5
Swap:          0           0           0

tivice@tivi-81lk:~$ free -t
      total        used        free      shared  buff/cache   available
Mem:    8020808      1240380     4862168     532148     1918260     5977148
Swap:          0              0              0
Total:    8020808      1240380     4862168

tivice@tivi-81lk:~$ free -o
free: invalid option -- 'o'

Usage:
free [options]

Options:
-b, --bytes      show output in bytes
--kilo           show output in kilobytes
--mega           show output in megabytes
--giga           show output in gigabytes
--tera          show output in terabytes
--peta           show output in petabytes
-k, --kibi       show output in kibibytes
-m, --mebi       show output in mebibytes
-g, --gibi       show output in gibibytes
--tebi          show output in tebibytes
--pebi          show output in pebibytes
-h, --human      show human-readable output
--si            use powers of 1000 not 1024
-l, --lohi       show detailed low and high memory statistics
-t, --total      show total for RAM + swap
-s N, --seconds N repeat printing every N seconds
-c N, --count N  repeat printing N times, then exit
-w, --wide       wide output

--help          display this help and exit
-V, --version    output version information and exit

For more details see free(1).
tivice@tivi-81lk:~$ free -s
free: option requires an argument -- 's'

Usage:
free [options]
```

```
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tivic@tivi-81lk:~$ free -s
free: option requires an argument -- 's'

Usage:
free [options]

Options:
-b, --bytes          show output in bytes
--kilo              show output in kilobytes
--mega             show output in megabytes
--giga            show output in gigabytes
--tera           show output in terabytes
--peta           show output in petabytes
-k, --kibi       show output in kibibytes
-m, --mebi       show output in mebibytes
-g, --gibi       show output in gibibytes
--tebi          show output in tebibytes
--pebi          show output in pebibytes
-h, --human      show human-readable output
--si            use powers of 1000 not 1024
-l, --lohi      show detailed low and high memory statistics
-t, --total     show total for RAM + swap
-s N, --seconds N repeat printing every N seconds
-c N, --count N repeat printing N times, then exit
-w, --wide      wide output

--help    display this help and exit
-V, --version output version information and exit

For more details see free(1).
tivic@tivi-81lk:~$ free -v
free: invalid option -- 'v'

Usage:
free [options]

Options:
-b, --bytes          show output in bytes
--kilo              show output in kilobytes
--mega             show output in megabytes
--giga            show output in gigabytes
--tera           show output in terabytes
--peta           show output in petabytes
-k, --kibi       show output in kibibytes
-m, --mebi       show output in mebibytes
-g, --gibi       show output in gibibytes
--tebi          show output in tebibytes
--pebi          show output in pebibytes
-h, --human      show human-readable output
--si            use powers of 1000 not 1024
-l, --lohi      show detailed low and high memory statistics
-t, --total     show total for RAM + swap
-s N, --seconds N repeat printing every N seconds
-c N, --count N repeat printing N times, then exit
-w, --wide      wide output
```

```
~ : bash — Konsole
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tivic@tivi-81lk:~$ free -s
free: option requires an argument -- 's'

Usage:
free [options]

Options:
-b, --bytes          show output in bytes
--kilo              show output in kilobytes
--mega             show output in megabytes
--giga            show output in gigabytes
--tera           show output in terabytes
--peta          show output in petabytes
-k, --kibi      show output in kibibytes
-m, --mebi     show output in mebibytes
-g, --gibi     show output in gibibytes
--tebi        show output in tebibytes
--pebi        show output in pebibytes
-h, --human    show human-readable output
--si          use powers of 1000 not 1024
-l, --lohi     show detailed low and high memory statistics
-t, --total    show total for RAM + swap
-s N, --seconds N repeat printing every N seconds
-c N, --count N repeat printing N times, then exit
-w, --wide     wide output

--help    display this help and exit
-V, --version output version information and exit

For more details see free(1).
tivic@tivi-81lk:~$ free -v
free: invalid option -- 'v'

Usage:
free [options]

Options:
-b, --bytes          show output in bytes
--kilo              show output in kilobytes
--mega             show output in megabytes
--giga            show output in gigabytes
--tera           show output in terabytes
--peta          show output in petabytes
-k, --kibi      show output in kibibytes
-m, --mebi     show output in mebibytes
-g, --gibi     show output in gibibytes
--tebi        show output in tebibytes
--pebi        show output in pebibytes
-h, --human    show human-readable output
--si          use powers of 1000 not 1024
-l, --lohi     show detailed low and high memory statistics
-t, --total    show total for RAM + swap
-s N, --seconds N repeat printing every N seconds
-c N, --count N repeat printing N times, then exit
-w, --wide     wide output
```


g.) Kérdezze le az átlagos CPU terhelést vagy lemez aktivitást. - \$ iostat Használja a következő opciókat [-c] [-d] [-N] [-n] [-h] [-k | -m] [-t] [-V] [-x] [-z]

[device [...] | ALL] [-p [device [,...] | ALL]] [interval [count]]

```
> ~ : bash — Konsole
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Preconfiguring packages ...
Selecting previously unselected package sysstat.
(Reading database ... 197489 files and directories currently installed.)
Preparing to unpack .../sysstat_12.2.0-2ubuntu0.1_amd64.deb ...
Unpacking sysstat (12.2.0-2ubuntu0.1) ...
Setting up sysstat (12.2.0-2ubuntu0.1) ...

Creating config file /etc/default/sysstat with new version
update-alternatives: using /usr/bin/sar.sysstat to provide /usr/bin/sar (sar) in auto mode
Created symlink /etc/systemd/system/multi-user.target.wants/sysstat.service → /lib/systemd/system/sysstat.service.
Processing triggers for man-db (2.9.1-1) ...
Not building database; man-db/auto-update is not 'true'.
Processing triggers for systemd (245.4-4ubuntu3.15) ...
tivic@tivi-81lk:~$ iostat
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,89    0,01    1,38    0,05    0,00    94,66

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01         0,02         0,00         0,00         28          0          0
nvme0n1            0,41         11,47         0,00         0,00        17263          1          0
sda               21,37        761,59        237,61        190,33     1146128     357589     286424

tivic@tivi-81lk:~$
```

```
> ~ : bash — Konsole
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3,90    0,02    1,38    0,05    0,00    94,65

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01         0,02         0,00         0,00         28          0          0
nvme0n1            0,37         10,51         0,00         0,00        17263          1          0
sda               20,06        697,50        250,51        174,45     1146136     411637     286656

tivic@tivi-81lk:~$ iostat -d
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01         0,02         0,00         0,00         28          0          0
nvme0n1            0,37         10,34         0,00         0,00        17263          1          0
sda               19,85        686,54        247,44        171,77     1146136     413093     286756

tivic@tivi-81lk:~$ iostat -c
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,90    0,02    1,38    0,05    0,00    94,65

tivic@tivi-81lk:~$
```

```
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[ -j { ID | LABEL | PATH | UUID | ... } ]
[ --dec={ 0 | 1 | 2 } ] [ --human ] [ -o JSON ]
[ [ -H ] -g <group_name> ] [ -p [ <device> [,...] | ALL ] ]
[ <device> [...] | ALL ]
tivic@tivi-81lk:~$ iostat -N
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,90    0,02   1,38   0,05   0,00   94,65

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01        0,02        0,00        0,00        28         0         0
nvme0n1            0,37        10,51        0,00        0,00       17263         1         0
sda                20,06       697,50       250,51       174,45     1146136     411637     286656

tivic@tivi-81lk:~$ iostat -d
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01        0,02        0,00        0,00        28         0         0
nvme0n1            0,37        10,34        0,00        0,00       17263         1         0
sda                19,85       686,54       247,44       171,77     1146136     413093     286756

tivic@tivi-81lk:~$
```

```
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3,90    0,02   1,39   0,05   0,00   94,65

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ iostat -n
Usage: iostat [ options ] [ <interval> [ <count> ] ]
Options are:
[ -c ] [ -d ] [ -h ] [ -k ] [ -m ] [ -N ] [ -s ] [ -t ] [ -V ] [ -x ] [ -y ] [ -z ]
[ -j { ID | LABEL | PATH | UUID | ... } ]
[ --dec={ 0 | 1 | 2 } ] [ --human ] [ -o JSON ]
[ [ -H ] -g <group_name> ] [ -p [ <device> [,...] | ALL ] ]
[ <device> [...] | ALL ]
tivic@tivi-81lk:~$ iostat -N
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,90    0,02   1,38   0,05   0,00   94,65

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01        0,02        0,00        0,00        28         0         0
nvme0n1            0,37        10,51        0,00        0,00       17263         1         0
sda                20,06       697,50       250,51       174,45     1146136     411637     286656

tivic@tivi-81lk:~$
```

```
~ : bash — Konsole
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tivic@tivi-81lk:~$ iostat -n
Usage: iostat [ options ] [ <interval> [ <count> ] ]
Options are:
[ -c ] [ -d ] [ -h ] [ -k | -m ] [ -N ] [ -s ] [ -t ] [ -V ] [ -x ] [ -y ] [ -z ]
[ -j { ID | LABEL | PATH | UUID | ... } ]
[ --dec={ 0 | 1 | 2 } ] [ --human ] [ -o JSON ]
[ [ -H ] -g <group_name> ] [ -p [ <device> [...] | ALL ] ]
[ <device> [...] | ALL ]
tivic@tivi-81lk:~$ iostat [-n]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,90    0,02   1,38    0,05    0,00   94,65

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$
```

```
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Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ iostat [-h]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,90    0,02   1,38    0,05    0,00   94,65

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ iostat -h
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,9%    0,0%   1,4%    0,0%    0,0%   94,7%

      tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd Device
      0,01      0,0k      0,0k      0,0k      28,0k      0,0k      0,0k loop0
      0,35      9,8k      0,0k      0,0k      16,9M      1,0k      0,0k nvme0n1
      19,09     651,6k     237,0k     163,3k      1,1G     407,1M     280,4M sda

tivic@tivi-81lk:~$
```

```
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tivic@tivi-81lk:~$ iostat -k
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,90    0,02   1,41   0,05    0,00   94,62

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01         0,02         0,00         0,00         28         0         0
nvme0n1            0,34         9,73         0,00         0,00       17263         1         0
sda               19,03        646,10       235,77       161,91     1146136     418249     287220

tivic@tivi-81lk:~$ iostat [-k]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,90    0,02   1,42   0,05    0,00   94,62

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ iostat [-k | -m ]
-m: command not found
tivic@tivi-81lk:~$ iostat -k | -m
-m: command not found
tivic@tivi-81lk:~$
```

```
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-m: command not found
tivic@tivi-81lk:~$ iostat -k | -m
-m: command not found
tivic@tivi-81lk:~$ iostat -t
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

2022-03-01 15:42:24
avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,89    0,02   1,51   0,05    0,00   94,53

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01         0,02         0,00         0,00         28         0         0
nvme0n1            0,33         9,33         0,00         0,00       17263         1         0
sda               19,00        619,64       231,63       155,41     1146351     428525     287516

tivic@tivi-81lk:~$ iostat [-t]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,89    0,02   1,52   0,05    0,00   94,52

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ m
```

```
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-m: command not found
tivic@tivi-81lk:~$ iostat -k | -m
-m: command not found
tivic@tivi-81lk:~$ iostat -t
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

2022-03-01 15:42:24
avg-cpu:  %user   %nice %system %iowait  %steal   %idle
            3,89    0,02   1,51   0,05    0,00   94,53

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01        0,02         0,00         0,00        28          0          0
nvme0n1            0,33         9,33         0,00         0,00       17263          1          0
sda               19,00       619,64       231,63       155,41     1146351     428525     287516

tivic@tivi-81lk:~$ iostat [-t]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
            3,89    0,02   1,52   0,05    0,00   94,52

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ m
```

```
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nvme0n1            0,33         9,33         0,00         0,00       17263          1          0
sda               19,00       619,64       231,63       155,41     1146351     428525     287516

tivic@tivi-81lk:~$ iostat [-t]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
            3,89    0,02   1,52   0,05    0,00   94,52

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ iostat -V
sysstat version 12.2.0
(C) Sebastien Godard (sysstat <at> orange.fr)
tivic@tivi-81lk:~$ iostat [-V]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
            3,88    0,02   1,53   0,05    0,00   94,52

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$
```

```
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tivic@tivi-81lk:~$ iostat [-x]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,88    0,02   1,54    0,05    0,00   94,51

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ iostat -x
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,88    0,02   1,54    0,05    0,00   94,52

Device            r/s    kB/s    rrqm/s  %rrqm r_await rareq-sz    w/s    kB/s    wrqm/s  %wrqm w_await wareq-sz
d/s    kB/s    drqm/s  %drqm d_await dareq-sz aqu-sz  %util
loop0    0,01    0,01    0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00
0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,00
nvme0n1   0,32    9,00    0,39   55,28    0,30    28,30    0,00    0,00    0,00    0,00   49,50    0,50
0,00    0,00    0,00    0,00    0,00    0,00    0,00    0,01
sda      11,77   597,34    4,05   25,60    0,56   50,76    6,40   226,24    9,41   59,54    1,17   35,37
0,54   149,90    0,00    0,00    2,90   276,62    0,02    1,25

tivic@tivi-81lk:~$
```

```
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New Tab Split View Copy Paste Find

sda      11,77   597,34    4,05   25,60    0,56   50,76    6,40   226,24    9,41   59,54    1,17   35,37
0,54   149,90    0,00    0,00    2,90   276,62    0,02    1,25

tivic@tivi-81lk:~$ iostat -z
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,88    0,02   1,54    0,04    0,00   94,51

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0    0,01    0,01    0,00    0,00    28        0        0
nvme0n1   0,32    8,90    0,00    0,00   17263      1        0
sda      18,59   590,86   224,52   148,30  1146359  435593  287728

tivic@tivi-81lk:~$ iostat [-z]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,87    0,02   1,56    0,04    0,00   94,51

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$
```

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find

tivic@tivi-81lk:~$ iostat -p
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,87    0,02   1,55    0,04    0,00   94,52

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
loop0              0,01         0,01         0,00         0,00         28         0         0
nvme0n1            0,31         8,67         0,00         0,00       17263         1         0
nvme0n1p1          0,05         1,65         0,00         0,00        3284         0         0
nvme0n1p2          0,13         3,69         0,00         0,00       7351         1         0
nvme0n1p3          0,04         0,50         0,00         0,00       1004         0         0
nvme0n1p4          0,06         1,90         0,00         0,00       3780         0         0
sda               18,35       575,88       220,51       144,62     1146359     438945     287880
sda1              0,05         1,02         0,00         0,00        2029         0         0
sda2              0,04         1,66         0,00         0,00        3296         0         0
sda3              18,08       572,52       220,51       144,62     1139655     438945     287880

tivic@tivi-81lk:~$ iostat [-p]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,86    0,02   1,55    0,04    0,00   94,52

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
```

h.) Kérdezze le a rendszer aktivitási adatok jelzéseit és összegyűjtését, mentését.

\$ sar Opciói: sar -n DEV | more

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find

nvme0n1p1          0,05         1,65         0,00         0,00        3284         0         0
nvme0n1p2          0,13         3,69         0,00         0,00       7351         1         0
nvme0n1p3          0,04         0,50         0,00         0,00       1004         0         0
nvme0n1p4          0,06         1,90         0,00         0,00       3780         0         0
sda               18,35       575,88       220,51       144,62     1146359     438945     287880
sda1              0,05         1,02         0,00         0,00        2029         0         0
sda2              0,04         1,66         0,00         0,00        3296         0         0
sda3              18,08       572,52       220,51       144,62     1139655     438945     287880

tivic@tivi-81lk:~$ iostat [-p]
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3,86    0,02   1,55    0,04    0,00   94,52

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd

tivic@tivi-81lk:~$ sar -n DEV | more
Cannot open /var/log/sysstat/sa01: No such file or directory
Please check if data collecting is enabled
tivic@tivi-81lk:~$ sar
Cannot open /var/log/sysstat/sa01: No such file or directory
Please check if data collecting is enabled
tivic@tivi-81lk:~$
```

i.) Kérdezze le mindegyik elérhető processzor aktivitását több processzoros sz.gép használata esetén.
- mpstat

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find
tivic@tivi-81lk:~$ mpstat
Linux 5.11.0-46-generic (tivi-81lk)      2022-03-01      _x86_64_      (8 CPU)
15:46:43    CPU   %usr   %nice    %sys %iowait    %irq   %soft  %steal  %guest   %gnice   %idle
15:46:43    all    3,83    0,02    1,54    0,04    0,00    0,03    0,00    0,00    0,00   94,54
tivic@tivi-81lk:~$
```

j.) Kérdezze le processz memória használatát jelzi.

- pmap Opciói: [-d PID] vagy egy adott processz esetén: [pmap -d 47394

```
~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
New Tab Split View Copy Paste Find
15:46:43    all    3,83    0,02    1,54    0,04    0,00    0,03    0,00    0,00    0,00   94,54
tivic@tivi-81lk:~$ pmap

Usage:
pmap [options] PID [PID ...]

Options:
-x, --extended          show details
-X                      show even more details
      WARNING: format changes according to /proc/PID/smaps
-XX                     show everything the kernel provides
-c, --read-rc           read the default rc
-C, --read-rc-from=<file> read the rc from file
-n, --create-rc         create new default rc
-N, --create-rc-to=<file> create new rc to file
      NOTE: pid arguments are not allowed with -n, -N
-d, --device            show the device format
-q, --quiet             do not display header and footer
-p, --show-path         show path in the mapping
-A, --range=<low>[,<high>] limit results to the given range

-h, --help             display this help and exit
-V, --version          output version information and exit

For more details see pmap(1).
tivic@tivi-81lk:~$
```


2. Feladat:

1. Kérdezze le a PowerShellVerzió!

```
PS C:\Users\tivko> $PSVersionTable

Name                           Value
----                           -
PSVersion                      5.1.19041.1320
PSEdition                      Desktop
PSCompatibleVersions           {1.0, 2.0, 3.0, 4.0...}
BuildVersion                   10.0.19041.1320
CLRVersion                     4.0.30319.42000
WSManStackVersion              3.0
PSRemotingProtocolVersion      2.3
SerializationVersion           1.1.0.1
```

2. Kérdezze le a mai dátumot?

```
PS C:\Users\tivko> Get-Date

2022. március 8., kedd 9:39:20
```

3. Kérdezze le a szolgáltatásokat?

```
PS C:\Users\tivko> Get-Service

Status Name                DisplayName
-----
Running AarSvc_339f7        AarSvc_339f7
Stopped AJRouter        AllJoyn Router Service
Stopped ALG           Application Layer Gateway Service
Stopped AppIDSvc       Application Identity
Running AppInfo        Application Information
Stopped AppReadiness   App Readiness
Running AppXSvc        AppX Deployment Service (AppXSVC)
Running AudioEndpointBu... Windows Audio Endpoint Builder
Running Audiosrv       Windows Audio
Stopped autotimesvc    Cellular Time
Stopped AxInstSV       ActiveX Installer (AxInstSV)
Stopped BcastDVRUserSer... BcastDVRUserService_339f7
Stopped BDESVC         BitLocker Drive Encryption Service
Stopped BEService      BattlEye Service
Running BFE            Base Filtering Engine
Running BITS           Background Intelligent Transfer Ser...
Running BluetoothUserSe... BluetoothUserService_339f7
Running BrokerInfrastru... Background Tasks Infrastructure Ser...
Stopped Browser        Computer Browser
Running BTAGService     Bluetooth Audio Gateway Service
Running BthAvctpSvc     AVCTP service
Running bthserv         Bluetooth Support Service
Stopped camsvc          Capability Access Manager Service
Stopped CaptureService... CaptureService_339f7
Running cbdhsvc_339f7   cbdhsvc_339f7
Running CDPSvc          Connected Devices Platform Service
Running CDPUserSvc_339f7 CDPUserSvc_339f7
Stopped CertPropSvc     Certificate Propagation
Running ClickToRunSvc   Microsoft Office Click-to-Run Service
Stopped ClipSvc         Client License Service (ClipSvc)
Stopped COMSysApp       COM+ System Application
Stopped ConsentUxUserSv... ConsentUxUserSvc_339f7
Running CoreMessagingRe... CoreMessaging
Running cphs            Intel(R) Content Protection HECI Se...
Running cplspcon        Intel(R) Content Protection HDCP Se...
Stopped CredentialEnrol... CredentialEnrollmentManagerUserSvc_...
Running CryptSvc        Cryptographic Services
Running DcomLaunch      DCOM Server Process Launcher
Stopped defragsvc       Optimize drives
Stopped DeviceAssociati... DeviceAssociationBrokerSvc_339f7
Running DeviceAssociati... Device Association Service
Running DeviceInstall    Device Install Service
Stopped DevicePickerUse... DevicePickerUserSvc_339f7
```

4. Kérdezze le a C:\ meghajtó lévő könyvtárakat ill. fájlokat?

```
PS C:\Users\tivko> ls

Directory: C:\Users\tivko

Mode                LastWriteTime         Length Name
----                -
d-----          2022. 02. 05.         10:41      .android
d-----          2022. 02. 07.         21:05      .dist
d-----          2022. 02. 04.         20:43      .vscode
d-r---          2022. 02. 01.         13:53      3D Objects
d-----          2022. 02. 01.         15:32      ansel
d-----          2022. 02. 28.         16:17      ClionProjects
d-r---          2022. 02. 01.         13:53      Contacts
d-----          2022. 02. 01.         13:55      Documents
d-r---          2022. 03. 07.           9:19      Downloads
d-r---          2022. 02. 01.         13:53      Favorites
d-----          2022. 02. 21.         20:01      Homework
d-r---          2022. 02. 01.         13:53      Links
d-r---          2022. 02. 01.         13:53      Music
dar--l          2022. 03. 01.           9:25      OneDrive
d-r---          2022. 02. 01.         13:53      Saved Games
d-r---          2022. 02. 01.         13:54      Searches
d-r---          2022. 02. 02.         20:09      Videos
```

5. Kérdezze a parancsok rövidített neveit? (alias)

```
PS C:\Users\tivko> Get-Alias

CommandType      Name                                     Version      Source
-----
Alias            % -> ForEach-Object
Alias            ? -> Where-Object
Alias            ac -> Add-Content
Alias            asnp -> Add-PSSnapin
Alias            cat -> Get-Content
Alias            cd -> Set-Location
Alias            CFS -> ConvertFrom-String              3.1.0.0     Microsoft.PowerShell.Utility
Alias            chdir -> Set-Location
Alias            clc -> Clear-Content
Alias            clear -> Clear-Host
Alias            clhy -> Clear-History
Alias            cli -> Clear-Item
Alias            clp -> Clear-ItemProperty
Alias            cls -> Clear-Host
Alias            clv -> Clear-Variable
Alias            cnsn -> Connect-PSSession
Alias            compare -> Compare-Object
Alias            copy -> Copy-Item
Alias            cp -> Copy-Item
Alias            cpi -> Copy-Item
Alias            cpp -> Copy-ItemProperty
Alias            curl -> Invoke-WebRequest
Alias            cvpa -> Convert-Path
Alias            dbp -> Disable-PSBreakpoint
Alias            del -> Remove-Item
Alias            diff -> Compare-Object
Alias            dir -> Get-ChildItem
Alias            dsn -> Disconnect-PSSession
Alias            ebp -> Enable-PSBreakpoint
Alias            echo -> Write-Output
Alias            epal -> Export-Alias
Alias            epsv -> Export-Csv
Alias            epsn -> Export-PSSession
Alias            erase -> Remove-Item
Alias            etsn -> Enter-PSSession
Alias            exsn -> Exit-PSSession
Alias            fc -> Format-Custom
Alias            fhx -> Format-Hex                        3.1.0.0     Microsoft.PowerShell.Utility
Alias            fl -> Format-List
Alias            foreach -> ForEach-Object
Alias            ft -> Format-Table
Alias            fw -> Format-Wide
Alias            gal -> Get-Alias
Alias            gbp -> Get-PSBreakpoint
```

6. Készítsen egy „processz” nevű Alias, majd futtassa és kérdezze le?

```
PS C:\Users\tivko> Get-Service | ft name,status
```

Name	Status
AarSvc_339f7	Running
AJRouter	Stopped
ALG	Stopped
AppIDSvc	Stopped
Appinfo	Running
AppReadiness	Stopped
AppXSvc	Running
AudioEndpointBuilder	Running
Audiosrv	Running
autotimesvc	Stopped
AxInstSV	Stopped
BcastDVRUserService_339f7	Stopped
BDESVC	Stopped
BEService	Stopped
BFE	Running
BITS	Running
BluetoothUserService_339f7	Running
BrokerInfrastructure	Running
Browser	Stopped
BTAGService	Running
BthAvctpSvc	Running
bthserv	Running
camsvc	Stopped
CaptureService_339f7	Stopped
cbdhsvc_339f7	Running
CDPSvc	Running
CDPUserService_339f7	Running
CertPropSvc	Stopped
ClickToRunSvc	Running
ClipSvc	Stopped
COMSysApp	Stopped
ConsentUxUserSvc_339f7	Stopped
CoreMessagingRegistrar	Running
cphs	Running
cplspcon	Running
CredentialEnrollmentManagerUserSvc_339f7	Stopped
CryptSvc	Running
DcomLaunch	Running
defragsvc	Stopped
DeviceAssociationBrokerSvc_339f7	Stopped
DeviceAssociationService	Running
DeviceInstall	Running
DevicePickerUserSvc_339f7	Stopped

7. Listázza ki az adott meghajtón lévő szolgáltatásokat - formázott lista/tábla?

```
PS C:\Users\tivko> New-Alias "prAlias" Get-Process
PS C:\Users\tivko> prAlias | Sort-Object name
```

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
207	13	2344	10116	0,16	14876	1	AdobeIPCBroker
328	19	10344	26428	0,13	5692	1	ApplicationFrameHost
237	12	11468	18320	39,17	4452	0	audiodg
55	5	684	3404	0,03	14584	1	CCXProcess
270	13	4656	16880	3,06	11720	1	conhost
105	7	6348	5268	0,11	14608	1	conhost
106	7	6348	1184	0,09	10888	1	conhost
158	10	6660	7672		6384	0	conhost
158	10	6672	7668		6592	0	conhost
825	53	48900	58656	1,23	15064	1	Cortana
463	17	4436	19700	3,50	4468	1	ctfmon
725	27	2992	5504		832	1	csrss
702	24	1856	4928		680	0	csrss
379	18	4200	13600		2636	0	dashost
219	11	2452	10200		7148	1	DAX3API
288	11	4160	11960		4540	0	DAX3API
297	20	15612	38040	1,48	14108	1	Discord
776	112	172788	149192	220,64	14472	1	Discord
311	19	13444	57116	0,94	15396	1	Discord
944	51	40264	65724	9,13	9520	1	Discord
215	14	12368	24380	0,08	13492	1	Discord
436	30	65536	54348	93,97	14024	1	Discord
221	17	4156	13060	0,19	13908	1	dllhost
202	16	3180	10836		6552	0	dllhost
1273	52	363272	288288		1416	1	dwm
116	7	1632	5472		5232	0	esif_uf
507	18	8716	22884	1,42	3596	1	ETDCtrl
149	10	2188	8424		3532	1	ETDCtrlHelper
155	9	2060	5852		2816	0	ETDService
119	8	1772	5436	0,02	7948	1	ETDTouch
3129	274	113884	175796	45,55	6888	1	explorer
205	9	1776	7064		5164	0	FMSvc64
37	7	2144	4228		1144	1	fontdrvhost
37	6	1656	2732		1140	0	fontdrvhost
656	31	36924	2432	0,48	17288	1	GameBar
293	13	3296	14796	0,19	12664	1	GameBarFTServer
520	21	7624	25484		7656	0	gamingservices
116	6	1216	4356		7592	0	gamingservicesnet
0	0	60	8		0	0	Idle
180	10	1900	8404		3040	0	igfxCUIService
499	20	5464	18852	1,86	5052	1	igfxEM
144	8	1368	6892		1856	0	IntelCpHDCPSvc
130	7	1344	6480		2144	0	IntelCpHeciSvc
126	7	1120	4584		5780	0	jhi_service
212	10	2808	9076		5488	0	LMS

8. Rendezze sorba név szerint (növekvő/csökkenő) az objektumokat!

```
PS C:\Users\tivko> New-Alias "prAlias" Get-Process
PS C:\Users\tivko> prAlias | Sort-Object name
```

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
207	13	2344	10116	0,16	14876	1	AdobeIPCBroker
328	19	10344	26428	0,13	5692	1	ApplicationFrameHost
237	12	11468	18320	39,17	4452	0	audiodg
55	5	684	3404	0,03	14584	1	CCXProcess
270	13	4656	16880	3,06	11720	1	conhost
105	7	6348	5268	0,11	14608	1	conhost
106	7	6348	1184	0,09	10888	1	conhost
158	10	6660	7672		6384	0	conhost
158	10	6672	7668		6592	0	conhost
825	53	48900	58656	1,23	15064	1	Cortana
463	17	4436	19700	3,50	4468	1	ctfmon
725	27	2992	5504		832	1	csrss
702	24	1856	4928		680	0	csrss
379	18	4200	13600		2636	0	dashost
219	11	2452	10200		7148	1	DAX3API
288	11	4160	11960		4540	0	DAX3API
297	20	15612	38040	1,48	14108	1	Discord
776	112	172788	149192	220,64	14472	1	Discord
311	19	13444	57116	0,94	15396	1	Discord
944	51	40264	65724	9,13	9520	1	Discord
215	14	12368	24380	0,08	13492	1	Discord
436	30	65536	54348	93,97	14024	1	Discord
221	17	4156	13060	0,19	13908	1	dllhost
202	16	3180	10836		6552	0	dllhost
1273	52	363272	288288		1416	1	dwm
116	7	1632	5472		5232	0	esif_uf
507	18	8716	22884	1,42	3596	1	ETDCtrl
149	10	2188	8424		3532	1	ETDCtrlHelper
155	9	2060	5852		2816	0	ETDService
119	8	1772	5436	0,02	7948	1	ETDTouch
3129	274	113884	175796	45,55	6888	1	explorer
205	9	1776	7064		5164	0	FMSvc64
37	7	2144	4228		1144	1	fontdrvhost
37	6	1656	2732		1140	0	fontdrvhost
656	31	36924	2432	0,48	17288	1	GameBar
293	13	3296	14796	0,19	12664	1	GameBarFTServer
520	21	7624	25484		7656	0	gamingservices
116	6	1216	4356		7592	0	gamingservicesnet
0	0	60	8		0	0	Idle
180	10	1900	8404		3040	0	igfxCUIService
499	20	5464	18852	1,86	5052	1	igfxEM
144	8	1368	6892		1856	0	IntelCpHDCPSvc
130	7	1344	6480		2144	0	IntelCpHeciSvc
126	7	1120	4584		5780	0	jhi_service
212	10	2808	9076		5488	0	LMS

9. Kérdezze le azokat a neveket melynek első két betűje wi!

```
PS C:\Users\tivko> prAlias | Where-Object {$_.name -eq "wi" }
PS C:\Users\tivko> Get-Service | Group-Object status
```

Count	Name	Group
120	Running	{AarSvc_339f7, Appinfo, AudioEndpointBuilder, Audiosrv...}
154	Stopped	{AJRouter, ALG, AppIDSvc, AppReadiness...}

```
PS C:\Users\tivko>
```

10. Csoportosítsa állapot szerint az objektumokat!

```
PS C:\Users\tivko> prAlias | Where-Object {$_.name -eq "wi" }
PS C:\Users\tivko> Get-Service | Group-Object status
```

Count	Name	Group
120	Running	{AarSvc_339f7, Appinfo, AudioEndpointBuilder, Audiosrv...}
154	Stopped	{AJRouter, ALG, AppIDSvc, AppReadiness...}

```
PS C:\Users\tivko>
```

11. Számolja meg az objektumokat!

```
PS C:\Users\tivko> Get_Service | Measure-Object
Get_Service : The term 'Get_Service' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ Get_Service | Measure-Object
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (Get_Service:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\tivko>
```

12. Számolj meg az objektumok: max, min, avg, sum szerint!

```
PS C:\Users\tivko> Get_Service | Measure-Object
Get_Service : The term 'Get_Service' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ Get_Service | Measure-Object
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (Get_Service:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\tivko>
```

13. Kérdezze le a Windows időt!

```
PS C:\Users\tivko> Get-CimInstance -ClassName Win32_OperatingSystem

SystemDirectory      Organization BuildNumber RegisteredUser      SerialNumber      Version
-----
C:\Windows\system32  19044      tivko99@outlook.hu 00327-00000-00000-AA510 10.0.19044

PS C:\Users\tivko> Get-CimInstance -ClassName Win32_OperatingSystem | Select LastBootUpTime

LastBootUpTime
-----
2022. 03. 08. 8:07:53
```

14. Hozzon létre egy szoveg nevű változót, melynek értéke: Miskolc

```

PS C:\Users\tivko> $szoveg = 'Miskolc'
PS C:\Users\tivko> "szoveg".ToUpper()
SZOVEG
PS C:\Users\tivko> "szoveg".Length
6
PS C:\Users\tivko> "szoveg".Contains

OverloadDefinitions
-----
bool Contains(string value)

PS C:\Users\tivko> "szoveg".Split

OverloadDefinitions
-----
string[] Split(Params char[] separator)
string[] Split(char[] separator, int count)
string[] Split(char[] separator, System.StringSplitOptions options)
string[] Split(char[] separator, int count, System.StringSplitOptions options)
string[] Split(string[] separator, System.StringSplitOptions options)
string[] Split(string[] separator, int count, System.StringSplitOptions options)

PS C:\Users\tivko> "szoveg".Replace

OverloadDefinitions
-----
string Replace(char oldChar, char newChar)
string Replace(string oldValue, string newValue)

PS C:\Users\tivko>

```

15. Végezze el a következő műveleteket ((length, ToUpper, Replace, Contains, Split) a \$szoveg változó értékeivel Fájlkezelés (txt file)

```

PS C:\Users\tivko> $szoveg = 'Miskolc'
PS C:\Users\tivko> "szoveg".ToUpper()
SZOVEG
PS C:\Users\tivko> "szoveg".Length
6
PS C:\Users\tivko> "szoveg".Contains

OverloadDefinitions
-----
bool Contains(string value)

PS C:\Users\tivko> "szoveg".Split

OverloadDefinitions
-----
string[] Split(Params char[] separator)
string[] Split(char[] separator, int count)
string[] Split(char[] separator, System.StringSplitOptions options)
string[] Split(char[] separator, int count, System.StringSplitOptions options)
string[] Split(string[] separator, System.StringSplitOptions options)
string[] Split(string[] separator, int count, System.StringSplitOptions options)

PS C:\Users\tivko> "szoveg".Replace

OverloadDefinitions
-----
string Replace(char oldChar, char newChar)
string Replace(string oldValue, string newValue)

PS C:\Users\tivko>

```

16. Készítsen a C:\ meghajtóra egy neptunkod.txt fájl, melynek tartalma a teljes neve. Végezze el a következő feladatokat! a) Definiálás: b) Beolvasás: c) Tartalom megjelenítés: d) Sorok száma: e) Fájladatok:

```
PS C:\Users\tivko> Set-Content 02IXLB.txt 'Cziko Tivadar'
```

```
PS C:\Users\tivko> Get-Content 02IXLB.txt
```

```
Cziko Tivadar
```

```
PS C:\Users\tivko> Get-ItemProperty 02IXLB.txt
```

```
Directory: C:\Users\tivko
```

Mode	LastWriteTime	Length	Name
----	-----	-----	----
-a----	2022. 03. 08. 9:54	15	02IXLB.txt

```
PS C:\Users\tivko>
```